

Application Serial No.: 09/878,356
Filed: June 12, 2001

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

Claim 48 (Currently amended): A process for manufacturing a sub-assembly of an electrochemical generator comprising the steps of:

coating an electrode support in the presence of air with a solution comprising an electrode material, and a second first polymer which is slightly swellable with one or more polar aprotic solvents, and an optional coating solvent;

drying the coated electrode support to provide a porous composite electrode; and spreading onto the dried porous composite electrode, under anhydrous conditions, a liquid aprotic solution comprising a first polyether second polymer which comprises a polyether polymer or prepolymer, an optional volatile organic diluent, a polar aprotic solvent, and at least one alkali metal salt, to provide a first polymer matrix on the porous composite electrode which is which is thermally, UV, or electron beam cross-linkable and swellable with one or more polar aprotic solvents; wherein the liquid aprotic solution fills at least partially the porosity of the porous composite electrode and comprises in whole or in part an electrolyte separator at the surface of the composite electrode.

Claim 49 (Currently amended): The process of Claim 48, wherein the second first polymer is selected from the group consisting of vinylidene fluoride-co-hexafluoropropene, vinylidene fluoride, PVDF, polyacrylonitrile, poly(methylmethacrylate), and poly(ethylene propylene diene).

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Claim 50 (Currently amended): The process of Claim 48, wherein the ~~second~~ first polymer is a polyether polymer or prepolymer which is thermally, UV or electron beam cross-linkable, and the ~~first~~ second polymer swells less than the ~~second~~ first polymer when contacted with a polar aprotic solvent.

Claim 51 (Currently amended): The process of Claim ~~50~~ 48, wherein the porous composite electrode is a carbon anode.

Claim 52 (Currently amended): The process of Claim 48, wherein the porous composite electrode is a composite cathode having an electrode material comprising a phosphate of a transition metal ~~operating at 3.5-3.7 V~~.

Claim 53 (Currently amended): The process of Claim 48, wherein the liquid aprotic solution ~~further~~ comprises a ~~first polyether polymer, an optional volatile organic diluent, a polar aprotic solvent, and at least one alkali metal salt, and further~~ comprises a prepolymer, oligomer or monomer which is thermally, UV, or electron beam cross-linkable.

Claim 54 (Currently amended): The process of Claim ~~53~~ 48, wherein the polyether is thermally, UV, or electron beam cross-linkable.

Claim 55 (Previously presented): A process of assembling an electrochemical

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generator comprising:

joining an anodic sub-assembly made by the process of Claim 48 with a cathodic sub-assembly made by the process of Claim 48.

Claim 56 (Previously presented): The process of Claim 55, wherein the anodic sub-assembly is made by the process of Claim 51.

Claim 57 (Previously presented): The process of Claim 55, wherein an electrolytic separator which is less than 10 μm thick and which comprises a polyether and a solid filler is inserted between the cathodic and anodic sub-assemblies during said joining.

Claim 58 (Previously presented): The process of Claim 55, wherein the porosity of one of the cathodic or anodic sub-assemblies is at least partially unfilled, and the unfilled porosity is impregnated with a liquid electrolyte after said joining.

Claim 59 (Currently amended): The process of Claim 53, ~~wherein the prepolymer, oligomer or monomer is 48, further comprising adding~~ a crosslinking additive selected from the group consisting of trimethylolpropane triacrylate, trimethylolpropane trimethacrylate, polyethylene oxide diacrylate, polyethylene oxide dimethacrylate, glycerol triacrylate, glycerol trimethacrylate, pentaerythritol, tetraacrylate, glycerol propoxylate triacrylate, dipentaerythritol pentaacrylate, dipentaerythritol hexaacrylate, ~~and~~ di(trimethylolpropane) tetraacrylate, and mixtures thereof.

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Claim 60 (Currently amended): The process of Claim 48, further comprising the step of, prior to spreading the liquid aprotic solution, spreading onto the dried porous composite electrode a second liquid aprotic solution comprising a third polyether polymer or polyether prepolymer and at least one alkali metal salt, to provide a third second polymer matrix on the porous composite electrode which is which is thermally, UV, or electron beam cross-linkable and swellable with at least one polar aprotic solvent,

wherein the first polymer matrix is less swellable than the third second polymer matrix when contacted with a polar aprotic solvent.

Claim 61 (Currently amended): The process of Claim 60, wherein second the first polymer is selected from the group consisting of vinylidene fluoride-co-hexafluoropropene, vinylidene fluoride, PVDF, polyacrylonitrile, poly(methylmethacrylate), and poly(ethylene propylene diene).

Claim 62 (Previously presented): The process of Claim 48, wherein the polar aprotic solvents are selected from the group consisting of propylene carbonate, ethylene carbonate, tetrahydrofuran, 2-methyltetrahydrofuran, 1,3-dioxolane, 4,4-dimethyl-1,3-dioxolane, γ -butyrolactone, butylene carbonate, sulfolane, 3-methylsulfolane, tert-butyl-ether, 1,2-dimethoxyethane, 1,2-diethoxyethane, bis(methoxyethyl)ether, 1,2-ethoxymethoxyethane, tetrabutylmethylether, and glymes and sulfonamides of formula: $R_1R_2N-SO_2-NR_3R_4$, in which R_1 , R_2 , R_3 , and R_4 are each independently C_{1-6} alkyl groups or C_{1-6} oxyalkyl groups.

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Claim 63 (New): The process of claim 48, further comprising the step of adding a volatile organic diluent to the liquid aprotic solution to facilitate the spreading operation.

Claim 64 (New): The process of claim 48, further comprising the step of adding a volatile organic diluent to the solution comprising an electrode material to facilitate the coating operation.

Claim 65 (New): A process for manufacturing a sub-assembly of an electrochemical generator comprising the steps of:

-forming a composite cathode comprising a first polymer, a cathode material, at least one polar aprotic solvent and at least one alkali metal salt, said first polar aprotic solvent causing said polyether polymer to swell;

-forming an electrolyte separator comprising a second polymer, at least one second polar aprotic solvent and at least one alkali metal salt, said second polar aprotic solvent causing said second polymer to swell;

-said composite cathode and said electrolyte separator are disposed in contact with each other; and

-said first and second polar aprotic solvents are unequally distributed between said first and second polymer, thereby providing a macroscopic separation between said composite cathode and said electrolyte separator.

Claim 66 (New): A process as defined in claim 65, wherein said first and second polymer are cross-linkable.